Can Bacteria Live in Concrete?

The short answer is yes. In addition, the microbes may help identify structural instability in buildings.

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Many types of bacteria are known to degrade the stability of concrete. But findings published in mSystems, a journal of the American Society for Microbiology, show that different species of these microorganisms might also act to sound the alarm if a building develops structural problems. In addition, the microbes could one day be used to repair homes or infrastructure found in cities, such as roads and bridges, reports ScienceAlert.com.

For the study, University of Delaware researchers placed 40 concrete cylinders on the roof of their laboratory and observed them for a two-year period. Some cylinders were made of a typical mixture containing ingredients that render the concrete susceptible to a destructive chemical reaction. The rest were composed of a blend formulated to prevent this reaction.

After a DNA check of the samples, scientists found several common strains of bacteria—Proteobacteria, Firmicutes and Actinobacteria—that originated from individual components in the concrete. According to researchers, about 50% to 60% of the bacteria were generated by these ingredients—in particular, gravel.

Researchers proposed that since certain bacteria create calcium carbonate—a compound that can be used to plug the cracks and pores in concrete—engineers may be able to use the microbes to fix buildings and infrastructure.

“As far as we know, the microbes are not damaging the concrete,” said Julie Maresca, PhD, a University of Delaware microbiologist who supervised a team of students involved in the investigation. “Microbes are not eating the foundations. We’re hoping to use them for information and potentially to help with repair.”

In the wake of the recent collapse of a condo building in Surfside, Florida, that claimed almost 100 lives, municipalities are searching for ways to protect people and property. Maresca and other scientists believe that more studies about bacteria residing in concrete just might allow engineers to pinpoint instability in structures long before such disasters occur.

To learn more about microbes, read “Study Shows Thousands of Bacteria Live on Common Objects” and “Microbes and Mental Health.”

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